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JUNIPER TIP BLIGHT

Tip blight and dieback of twigs on juniper and, more rarely on arborvitae, hemlock, true fir, and Douglas-fir, can result from any of several causes, biotic (living) and abiotic (nonliving). This problem is sometimes less serious as plants become older, although it can be found on established plants, especially those growing under crowded or stressed conditions.

SYMPTOMS AND DISEASE DEVELOPMENT:

Tips of branches affected by this problem turn brown or ash gray and often show progressive dieback. In extreme cases the entire plant is killed. **Abiotic** causes of tip blight include winter drying and injury, drought or other environmental stress. The **biotic** organisms associated with tip blight are the fungi *Phomopsis* and *Kabatina*. *Phomopsis* typically infects newly developing foliage in spring and gradually moves into the stem. Symptoms develop on the current year's foliage and are often evident by mid-summer. *Kabatina* typically attacks wounded, year-old twigs and symptoms usually show up when foliage begins to regain its seasonal color in spring. *Kabatina* appears to require a wound, usually associated with insect activity, whereas *Phomopsis* is capable of directly penetrating healthy tissue. *Phomopsis* and *Kabatina* can overwinter in fruiting structures on infected twigs and both fungi may be present on affected shrubs.

In advanced stages of tip blights associated with fungi, small black fruiting bodies can be found at the base of blighted twigs. However, twig death from abiotic causes can sometimes appear the same as the fungal-associated blights since fruiting structures of some saprophytic fungi (ones that colonize dead tissues) look like plant pathogens (fungi that cause disease). Therefore, the first step to an effective management strategy is to accurately identify the cause. Microscopic examination is necessary to distinguish *Phomopsis* from *Kabatina*. In some cases there is a sharper line of demarcation between blighted and green tissue in twig blights from biotic than from abiotic causes.

MANAGEMENT STRATEGIES:

Control can be accomplished by following a multifaceted approach. Regardless of the cause, dead tissues should be pruned and removed from the area. Pruning should be done when the foliage is dry. When watering, avoid overhead irrigation and wetting the foliage or water early in the day to encourage rapid drying. New plantings should be spaced to provide good air circulation. Pruning of older plantings can help to reduce tip blight by improving air drainage

and foliar drying. It is also important to avoid wounding during transplanting and cultivating. Plants should be kept as vigorous as possible by fertilizing, controlling insect infestations, and watering during any periods of drought. Since resistant cultivars are available, they should be considered for use and many species of juniper have been reported to be resistant to at least one of the tip blights. For example, *Juniperus chinensis* cultivars "Femina" and Pfitzeriana" and *J. comminus* cultivars "Depressa" and "Saxatalis" are reported to be resistant to *Phomopsis.* *J. chinensis* "Hetzii" and *J. communis* "Hibernica" are resistant to *Kabatina.* Additionally, some cultivars are resistant to both fungi and include *J. chinensis* "Keteleeri" and "Pfitzeriana".

Fungicide applications can supplement other control strategies **if** the cause is **biotic**. For control of *Phomopsis*, the fungicides thiophanate methyl and thiophanate methyl + mancozeb are registered for use. Sprays should be applied when new growth begins to emerge in spring, with follow-up applications at 7-10 day intervals (or according to label instructions) or until new growth is mature and dark green. *Kabatina* can be controlled with the fungicides mancozeb or thiophanate methyl + mancozeb. Applications typically begin in mid-summer and continue when conditions are favorable (wet, cool, and cloudy). Since it is not uncommon for a plant to be infected with both fungi, the combination product of thiophanate methyl + mancozeb will control both diseases. All fungicide labels will contain information on dosage rates and safety precautions.

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